

PTO 06-1816

CY=WO DATE=20010208 KIND=A1  
PN=01-08996 A\

A SPIN-OPENING TYPE BOTTLE CAP FOR SEPARATING SOLUTE AND SOLVENT  
[Xuankaishi Rongzhi yu Rongji Fenge Pinggai]

Fucheng Yu

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C. January 2006

Translated by: FLS, Inc.

PUBLICATION COUNTRY	(19):	CN
DOCUMENT NUMBER	(11):	WO 01/08996 A1
DOCUMENT KIND	(12):	PATENT
PUBLICATION DATE	(43):	20010208
APPLICATION NUMBER	(21):	PCT/CN00/00177
DATE OF FILING	(22):	20000626
ADDITION TO	(61):	
INTERNATIONAL CLASSIFICATION	(51):	
PRIORITY	(30):	
INVENTORS	(72):	YU, FUCHENG
APPLICANT	(71):	YU, FUCHENG
DESIGNATED CONTRACTING STATES	(81):	
TITLE	(54):	A SPIN-OPENING TYPE BOTTLE CAP FOR SEPARATING SOLUTE AND SOLVENT
FOREIGN TITLE	[54A]:	Xuankaishi Rongzhi yu Rongji Fenge Pinggai

1. A type of spin-opening type bottle cap for separating a solute and a solvent, consisting of a top cover (10) and a lower cover (20) connected together. Of which, a top cover (10) is comprised of a roof body (15) formed by a single piece and a top cover inside receptacle (12). At least one cutting element (13) is extended downward at the bottom of the inside receptacle (12). The lower cover (20) includes a lower cover body (26) and a lower cover inside casing (21) forming a single unit through the shoulder (24). The lower cover inside casing (21) is designed with a bottom sealing sheet (22).

Its characteristics include a first inner thread (14) inside the aforementioned roof body (15). Of which, the bottom extends the top cover security strip (11). The aforementioned lower cover inside casing (21) protrudes to the top of shoulder (24), of which the diameter is larger than the lower diameter under the shoulder (24). Said upper and lower sections are connected through a middle incline (28). The upper outside of the lower cover inside casing (21) is designed with an external thread (25) that can connect with the first inner thread (14) of the top cover (10). When the top cover (10) and the lower cover (20) are threaded together, the bottom of the top cover security strip (11) tightens against the surface of the shoulder (24) on the lower cover (20). The lower inside wall of the inside casing (21) of the lower cover and the lower outside of the inside receptacle (12) of the top cover are slidably sealed. Additionally, the aforementioned bottom sealing sheet (22) level is connected at the

---

\* Number in the margin indicates pagination in the foreign text

bottom of the lower cover inside casing (21).

2. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 1, characterized by the lower outside of the top cover inside receptacle (12) forming a radial protrusion with at least one circle (16).

3. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 1, characterized by the bottom sealing sheet (22) passes through a cutting slot (29) and is connect to the bottom of the lower cover inside casing (21).

4. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 1, characterized by the distance (M) between the bottom surface of security strip (11) in the top cover (10) and the bottom cutter of the cutting element (13) equals or is less than the distance (N) between the bottom surface of the shoulder (24) on the lower cover (20) and the surface of the bottom sealing sheet (22).

5. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 1, characterized by a connector at the bottom surface edge of the bottom sealing sheet (22) and the bottom of the lower cover inside casing (21).

6. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 5, characterized by a connector piece (222) as the aforementioned connector.

7. A type of spin-opening type bottle cap for separating a solute and solvent as described in Claim 5, characterized by a dimple (221) as the aforementioned connector.

TECHNICAL FIELD OF THE PRESENT INVENTION

The present invention involves a type of bottle cap, specifically involving a type of spin-opening type bottle cap for separating a solute and a solvent.

TECHNICAL BACKGROUND OF THE CURRENT INVENTION

Based on the continuing development of consumer drinks, liquidized medicine, and sports drinks, newer and greater needs have emerged to address product dosage and preserve effectiveness, as well as provide an easy and convenient way to consume, carry, and use such drinks. For this reason, several types of bottle cap designs have been developed for solute storage and separation from solvents.

However, the bottom seal of most of the aforementioned designs is slanted, requiring a proper slanted alignment between the cutting element of the top cap to the bottom of the lower sealing plate. Else, the process of striking the top and bottom caps together will result in the cutting element cutting the bottom sealing plate, clearly making the entire process of using the device inconvenient. In addition, the slanted bottom sealing sheet also means that only a striking method can be used to connect the top and bottom caps, or else the cutting element will cut the bottom sealing sheet if a process of a turning motion is used. Furthermore, the seal tightness of a striking method is less effective. During the process of opening the top cover, the amount of force is difficult to control and the liquid inside the bottle can easily spill out.

Within most of the aforementioned designs, the gap between the cutting element used to cut the bottom sealing plate and the bottom sealing plate is difficult to control. Yet, this directly affects cutting effectiveness.

Within most of the aforementioned designs, the edge of the bottom sealing sheet and the inner wall of the lower cover inside casing are integrated together. When the cutting element cuts the bottom sealing sheet, this causes the bottom sealing sheet to fall in to the bottle, which is neither attractive nor sanitary.

#### DESCRIPTION OF THE PRESENT INVENTION

The purpose of the present invention is to provide a spin-opening type bottle cap for separating solute and solvent that overcomes the defects described in the aforementioned designs. Its structure is reasonable, the device is simple, it seals very tight, it is easy to use, and it meets sanitation requirements.

The purpose of the present invention is accomplished with the following technical solutions, provided by a type of spin-opening type bottle cap for separating a solute and solvent, consisting of a top cover and a lower cover connected together. Of which, a top cover is comprised of a roof body formed by a single piece and a top cover inside receptacle. At least one cutting element is extended downward at the bottom of the inside receptacle. The lower cover includes a lower cover body and a lower cover inside casing forming a single unit through the shoulder. The lower cover inside casing is designed with a bottom sealing sheet. Hence, a first inner thread is located inside the aforementioned roof body. Of which, the bottom extends the top cover security strip. The aforementioned

lower cover inside casing protrudes to the top of shoulder, of which  $\frac{1}{2}$  the diameter is larger than the lower diameter under the shoulder. Said upper and lower sections are connected through a middle incline. The upper outside of the lower cover inside casing is designed with an external thread that can connect with the first inner thread of the top cover. When the top cover and the lower cover are threaded together, the bottom of the top cover security strip tightens against the surface of the shoulder on the lower cover. The lower inside wall of the inside casing of the lower cover and the lower outside of the inside receptacle of the top cover are slidably sealed. Additionally, the aforementioned bottom sealing sheet level is connected at the bottom of the lower cover inside casing.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, the lower outside of the top cover inside receptacle forms a radial protrusion with at least one circle.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, the bottom sealing sheet passes through a cutting slot and is connect to the bottom of the lower cover inside casing.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, the distance between the bottom surface of security strip in the top cover and the bottom cutter of the cutting element equals or is less than the distance between the bottom surface of the shoulder on the lower cover and the surface of the bottom sealing sheet.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, a connector is located at the bottom surface edge of the bottom sealing sheet and the bottom of the lower cover inside casing.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, a connector piece is used as the aforementioned connector.

Within the described type of spin-opening type bottle cap for separating a solute and solvent, a dimple is used as the aforementioned connector.

The benefits of the present invention are the structure is reasonable; the top and bottom covers, as well as the entire cap and bottle device are simple; it seals tight; it is easy to use; and it meets sanitary requirements.

#### DESCRIPTION OF THE DIAGRAMS

The following are detailed integrated diagrams to describe the preferred embodiment of the present invention and to provide a clear understanding of the present invention and its characteristics and advantages.

Figure 1 is a vertical cutaway view of an embodiment of the present invention.

Figure 2 is an upward view of the sealing plate in the shown structure.

Figure 3 is a vertical cutaway view of another embodiment of the present invention.

Figure 4 is an upward view of the sealing plate of the shown structure.



## PREFERRED EMBODIMENT AND DETAILED DESCRIPTION OF THE CURRENT INVENTION

In reference to Figures 1 and 2, the spin-opening type bottle cap for separating a solute and solvent of the present invention is made of food product quality plastic. It includes a top cover 10 and lower cover 20.

Of which, the top cover 10 is comprised of a roof body 15 formed by a single piece and a top cover inside receptacle 12. First inner thread is located inside the roof body 15. Its bottom extends out a top cover security strip 11. The vertical length of the top cover inner receptacle 12 is longer than the total vertical length of the roof body 15 and the top cover security strip 11. Its lower external side forms a radial protrusion with at least one circle 16. Its bottom forms a downward extension with at least one cutting element 13 (the figure only shows one cutting element 13).

The lower cover 20 includes a lower cover body 26 and a lower cover inside casing 21 forming a single unit through the shoulder 24. The inside of lower cover body 26 (not drawn) can connect with the second thread 27 with the bottle opening thread. Its bottom extends downward to a security strip 23. The lower cover inside casing 21 protrudes to the top of the shoulder 24, of which the diameter is larger than the lower diameter under the shoulder 24. Said upper and lower sections are connected through a middle incline 28. The upper outside of the lower cover inside casing 21 is designed with an external thread 25 that can connect with the first inner thread 14 of the top cover 10. The lower inside wall of the inside

casing 21 of the lower cover and the lower outside of the inside receptacle 12 of the top cover are slidably sealed. In addition, the inside casing 21 is designed with a level bottom sealing sheet 22. For easier cutting, the bottom sealing sheet 22 is ideally placed through the cutting slot 29 and connected to the bottom of the inside casing 21. In addition, the surface edge of bottom sealing sheet 22 and the inside casing 21 can be designed with a connector, as shown in Figures 1 and 2 as a connector piece 222 and a dimple 221 in Figures 3 and 4. The distance  $M$  between the bottom surface of security strip 11 in the top cover 10 and the bottom cutter of the cutting element 13 equals or is less than the distance  $N$  between the bottom surface of the shoulder 24 on the lower cover 20 and the surface of the bottom sealing sheet 22. This aligns the location of the bottom cutter of the cutting element 13 on top of the bottom sealing sheet 22 when the bottom of the security seal 11 on the top cover 10 is attached to the surface of the shoulder 24.

During installation, add the solute (not drawn) in to the top cover inside receptacle 12. Thread lock the first thread of the top cover 10 through the external thread 25 of the bottom cover 20 to fasten the bottom cover 20 to the top cover 10. At this time, the external bottom of the top cover inside receptacle 12 passes through the circle 16 and the lower inside wall of the inside casing 21 of the lower cover and the lower outside of the inside receptacle 12 of the top cover are slidably sealed. The solute is placed in the sealed space formed by the inside receptacle 12 of the top cover and the inside casing 21 of the lower cover. Lastly,

the second thread 27 passes through the lower cover 20 to seal the solvent in the bottle (not drawn). The security strip 23 and the tight connection of the bottle prevents the removal of the entire separator lid.

To use, pull and remove the top security strip. The top cover 10 can then be twisted from the bottom cover 20. The process of twisting off the top cover 10 results in the one or more than one cutting elements 13 on the top cover 10 following the cutting slot 29 to break and cut the bottom sealing sheet 22 until the bottom sealing sheet 22 passes through connector 222 or 221 and connects to the bottom of the lower cover inside receptacle. At this time, the solute inside the bottle cap will naturally flow in to the bottle and mix with the solvent. The bottle can be shaken to evenly combine the mixture. When the lower cover 20 on the bottle is turned, the security strip 23 is removed from the lower cover body 26 and is left on the bottle opening. The entire separator lid can then be removed and used.

1/4

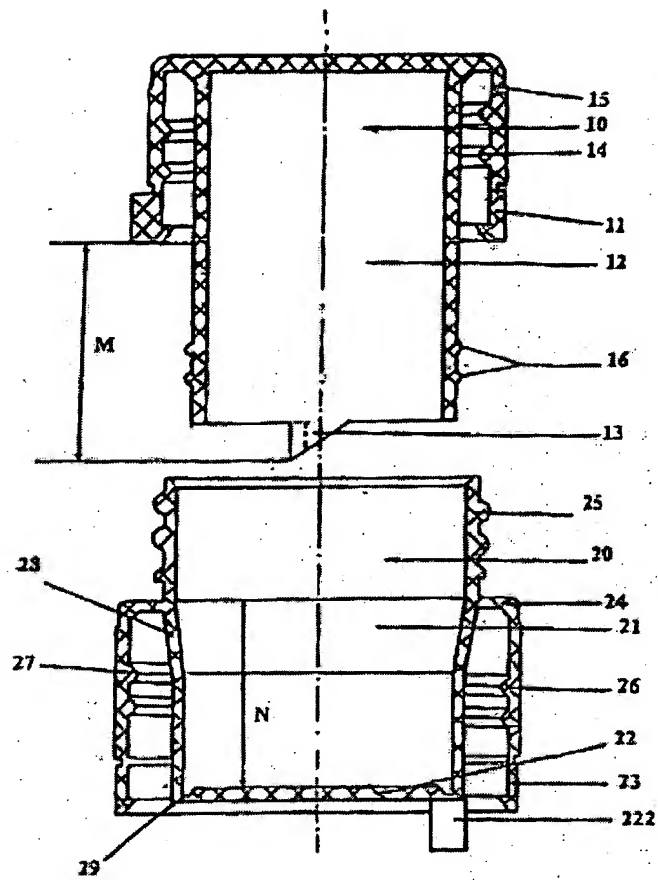


Figure 1

2/4

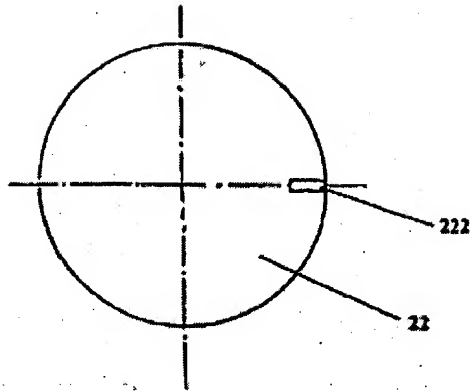


Figure 2

3/4

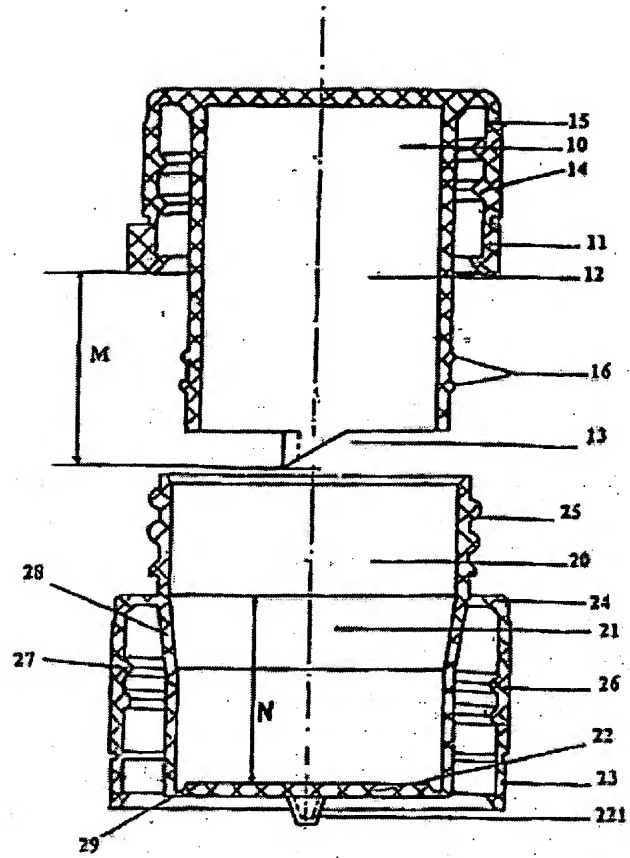


Figure 3

4/4

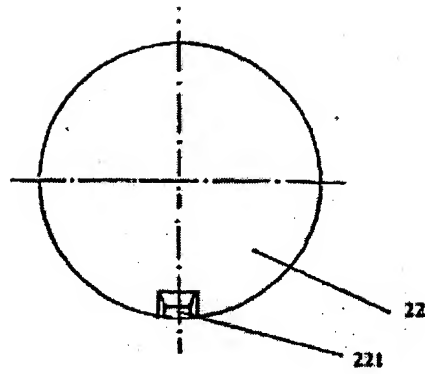


Figure 4